economy to become globally competitive, as demonstrated by its increasing share in world exports. Government S&T departments and agencies have undertaken or promoted research and development to provide innovative and contemporary technology to industry and India's recent growth has been driven by rapid expansion in export-oriented, skill intensive manufacturing and, skill intensive services. India is increasingly becoming a top global innovation player in bio-technology, pharmaceuticals, automatic and assembly, information technology (IT), software and IT-enabled services (ITES) and has already become the world's fourth-lane economy on purchasing power parity (PPP) basis.

(c) Eleventh Five Year Plan approach to S&T has emphasized the following:—

Setting up a national-level mechanism for evolving policies and providing direction to basic research;

Enlarging the pool of scientific manpower, strengthening the S&T infrastructure and attracting and retaining young people to career science;

Implementing selected National Flagship Programmes which have direct bearing on the technological competitiveness of the commission mode;

Establishing globally competitive research facilities and centres of excellence;

Kindling an innovative spirit among scientists to translate R&D leads into scalable technologies;

Developing new models of public private partnerships (PPPs) in higher education, particularly for research in universities and high technology areas;

Identifying ways and means of catalyzing industry-academia collaborations; and

Promoting strong linkages with advanced countries, including participation in mega international science initiatives.

The Eleventh Plan Outlay for S&T sector comprising of Department of Science and Technology, Department of Scientific and Industries Research and Department of Biotechnology the three Departments under the Ministry of Science and Technology, Ministry of Earth Sciences, Departments of Space and Atomic Energy has been raised to Rs. 75,304 crore, which is approximately three times the Plan Outlay.

Technology for removal of arsenic/ iron from ground water

2961. SHRIMATI JAYA BACHCHAN: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether it is a fact that a technology has been developed by a CSIR laboratory for removal of arsenic/iron from ground water by using ceramic membranes and another technology comprising of microbial cum adsorbent route;

(b) if so, the details thereof;

(c) whether the technology has been used in areas having ground water affected with arsenic and leading to a number of health problems; and

(d) if not, the reasons therefor?

THE MINISTER OF STATE OF THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI PRITHVIRAJ CHAVAN): (a) and (b) Yes Sir. A technology for removal of arsenic and/or iron from ground water using ceramic membrane module has been developed by Central Glass and Ceramics Research Institute (CGCRI), a CSIR laboratory in Kolkata for community application. CSIR has not developed any technology based on microbial cum adsorbent route for production of high quality drinking water from contaminated ground water.

The technology for arsenic and iron removal is essentially a hybrid type comprising of two steps:—

(i) Adsorption of arsenic by the colloidal media particles suspended in water, and

(ii) Application of membrane based separation technique for solid-liquid separation using ceramic micro-filtration membrane modules.

The advantages are:—

(i) The level of purification achieved is as per WHO recommended limits for arsenic (<0.01 ppm) and iron (<0.3 ppm) in Drinking Water.

(ii) Simultaneous removal of Arsenic and Iron from contaminated ground water makes the technology more superior.

(iii) The technology is capable of treating ground water containing higher concentrations of arsenic (up to 2.7 ppm) and iron (up to 13 ppm).

Patents:—

The technology is patented in USA (US Patent No. 7014771, dated March 21, 2006), Bangladesh (BD5912002, dated 28.03.2002), Chile (CL605-2002 dated 28.03.2002) and Taiwan (TW91106287 dated 29.3.2002). The patent has been filed in India (NF/235/2001)

(c) CGCRI/CSIR's technology for arsenic removal has been used for purification of ground water in some of the arsenic/iron affected areas including West Bengal. There are 6 beneficiaries in West Bengal and 15 beneficiaries in North-East States. The technology is also available for societal/commercial exploitation.

(d) Does not arise.

Progress in S&T

†2962. SHRI RAJIV PRATAP RUDY: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether it is a fact that our progress in Science and Technology is slow;

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†Original notice of the question was received in Hindi.